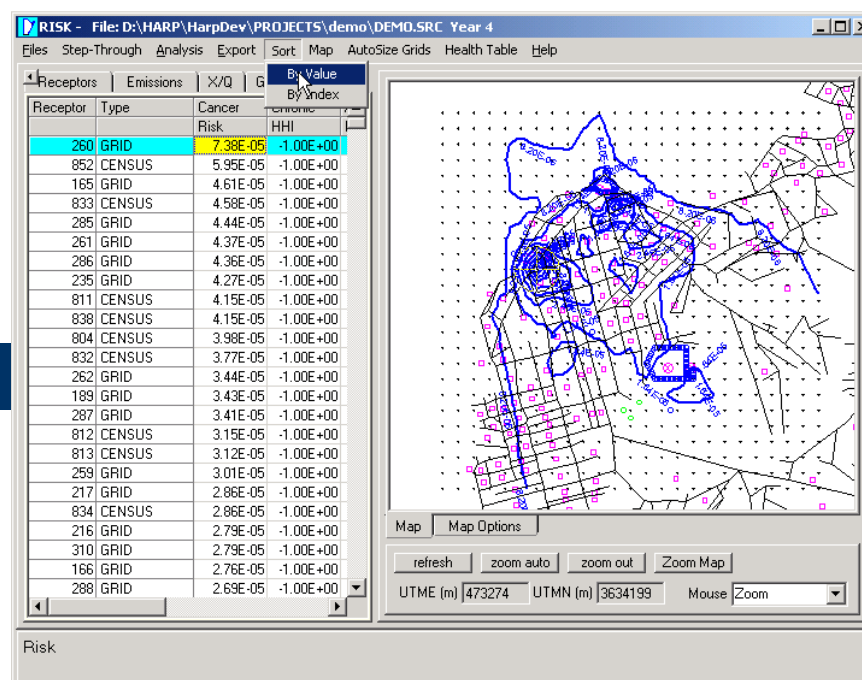


Batch Processing for Large Scale Assessments (HARP Regional Data Integrator)

Presented to:
USEPA Region 5
July 15, 2003

Presented by:
Jeff Dillingham, Ph.D.
Dillingham Software Engineering, Inc.
La Jolla, CA
858-551-8526
Email: Jeff@DillinghamSoftware.net



Dillingham Software Engineering, Inc.

What is HARP?

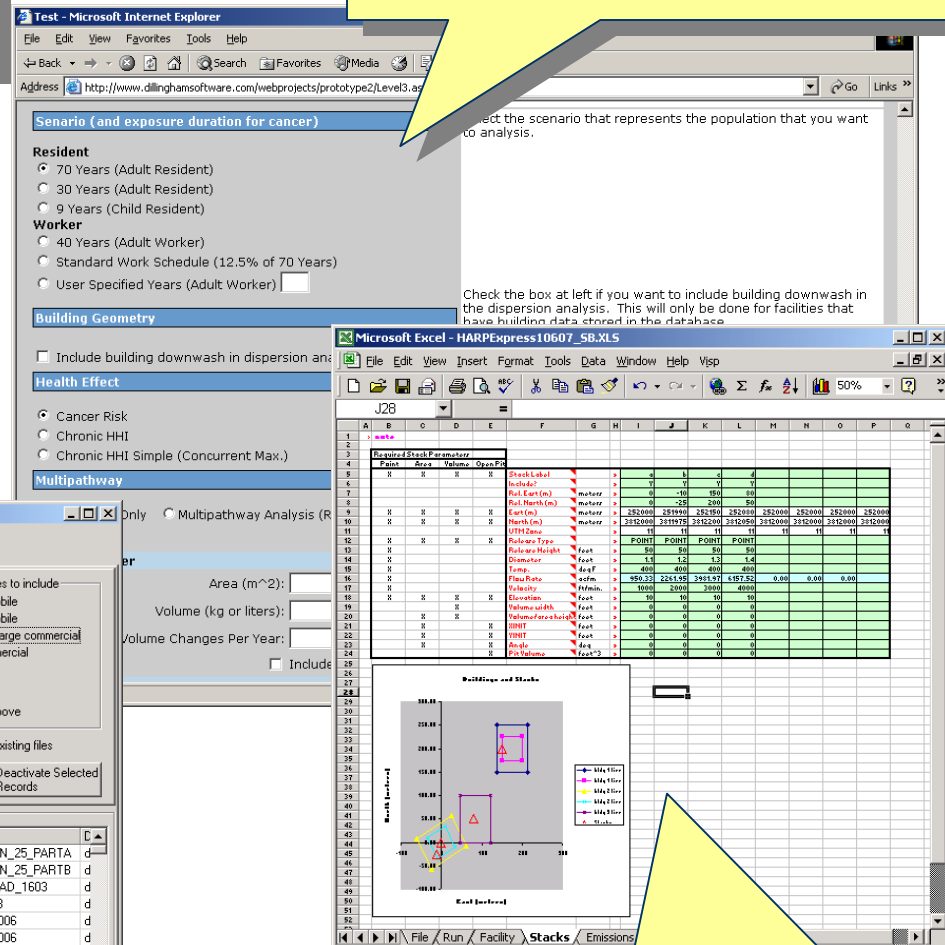


“Hot Spots Analysis and Reporting Program”

HARP integrates all of the data management, dispersion and risk analysis functions required for statewide air quality management into a single windows-based program.

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Web-based interface to HARP analysis functions



Spreadsheet for streamlined input of data. Run HARP dispersion and risk analysis from Excel

Four Steps to Regional Analysis



A. Dispersion analysis

Compute X/Q on source-centric grids, one source at a time using RAIMI-like grids.

B. GLC

Compute ground level concentrations (GLCs) on source-centric grids for each source.

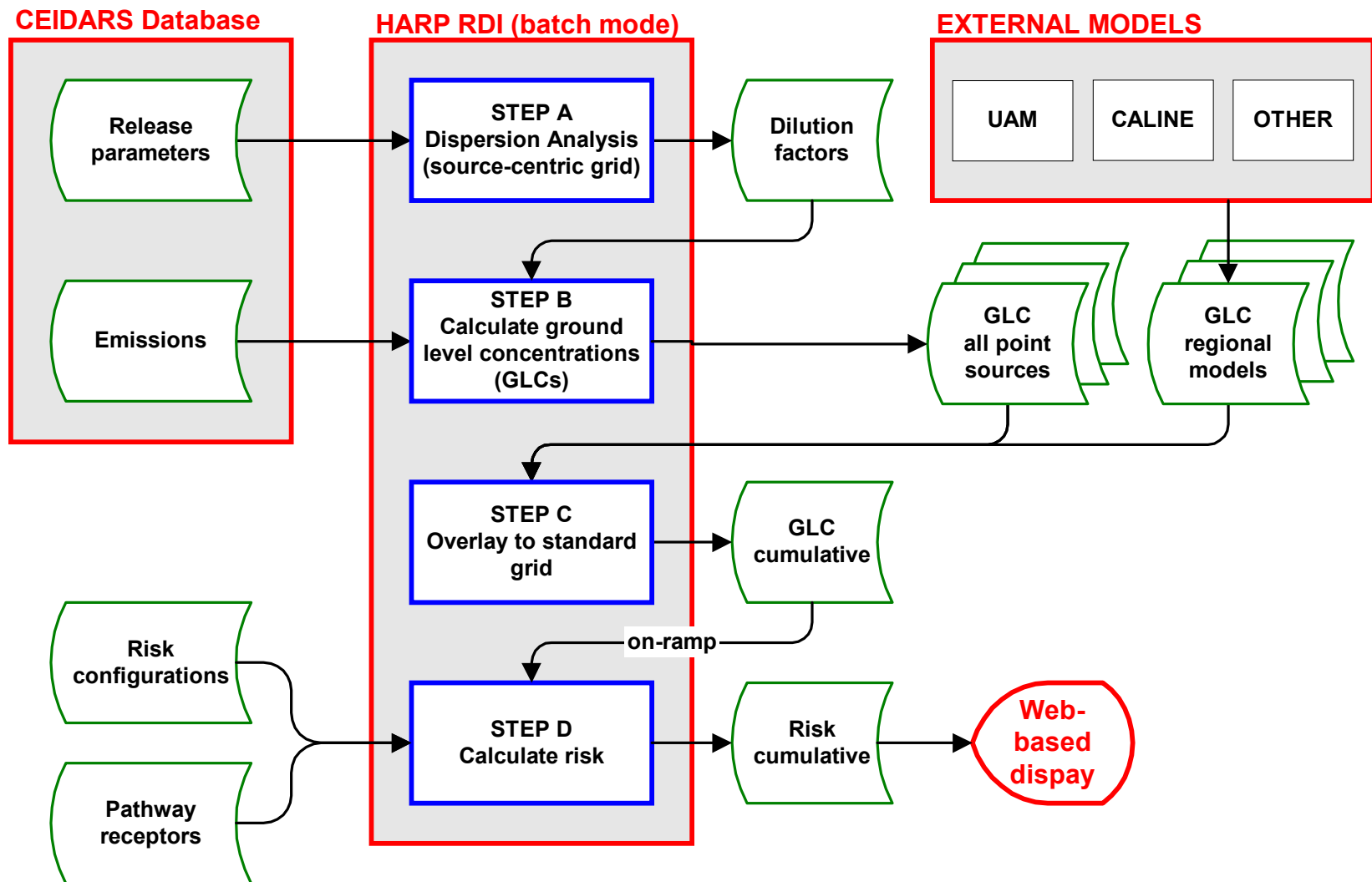
C. Overlay

GLCs from multiple sources are overlaid onto standard statewide grid.

D. Risk

Calculate risk on statewide grid.

Four Steps to Regional Analysis



- Facility-centric grids for ISC
 - Like RAIMI
 - 100 m spacing out to 3 km
 - 500 m spacing out to 10 km
- State-wide grid for integration
 - 1 or 2 km spacing for statewide reporting
 - 100 meter spacing for local (interactive) analysis
 - Teale-Albers projection

Why four steps?



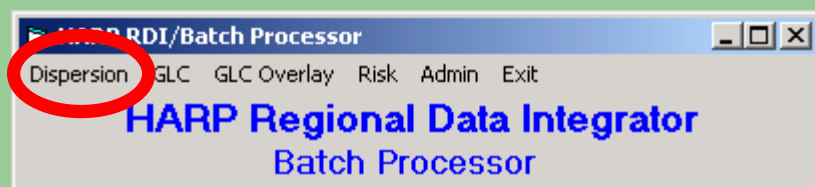
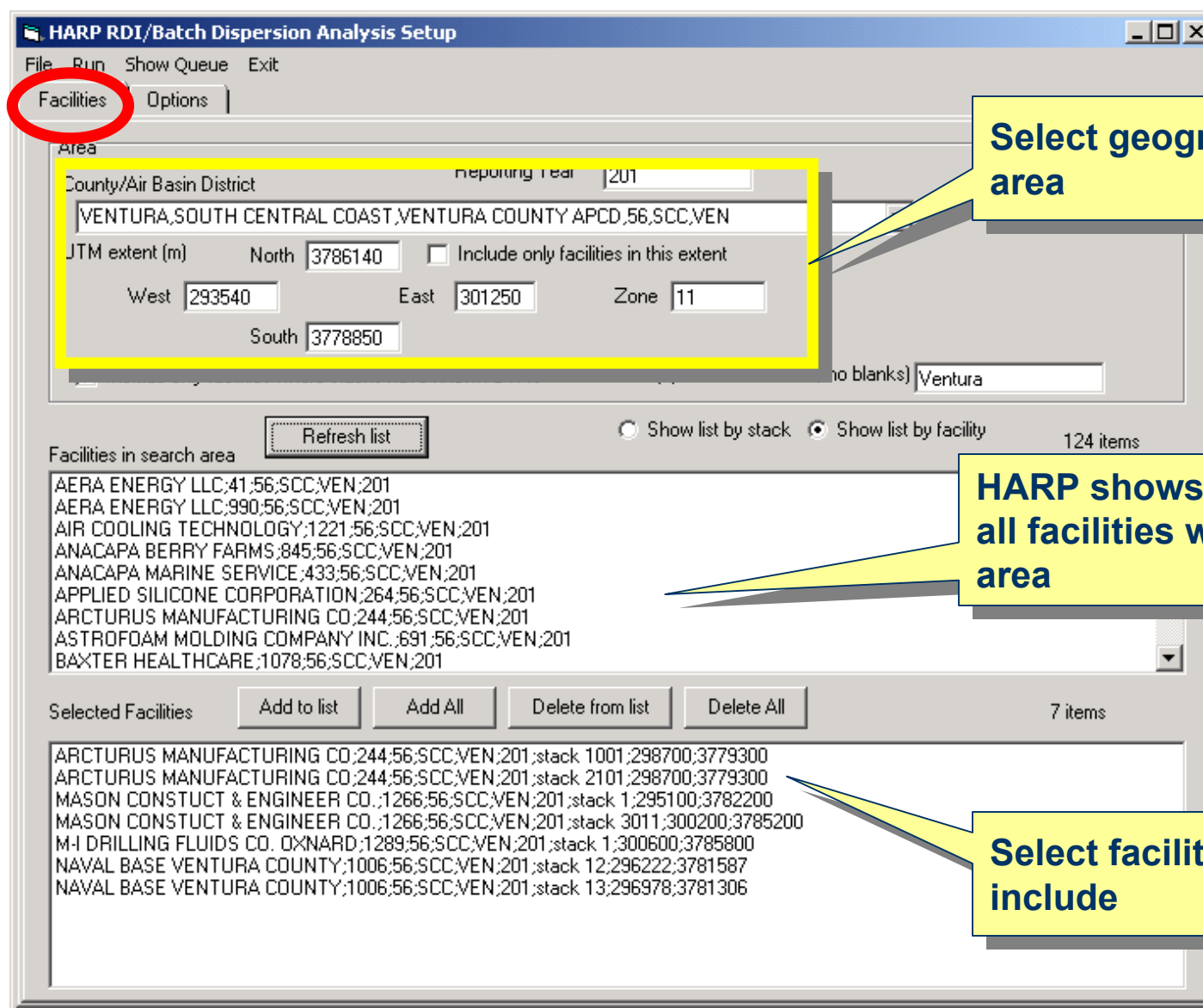
- **Storage and computational efficiency**
 - You only compute and store dilution factors for receptors that are near each source
- **Incremental updates of cumulative risk**
 - If one source changes, you rerun ISC for that single source and skip to step C, which typically only has to be done on one or two tiles
- **Multiple risk scenarios**
 - To change risk scenarios or pathway receptors, you can skip directly to step D and just recompute risk

Representative Storage Requirements



- **Dilution factors**
 - 10,000 sources x 5400 receptors x 5 averaging times x 10 bytes (ASCII) = 2.7 Gb
- **GLCs on source-centric grids**
 - Same as dilution factors x 50 chemicals = 135 Gb
- **GLCs on standard statewide 100 m grid**
 - 40,000,000 grid points x 50 chems x 5 averaging times x 5 source categories x 4 bytes (binary) = 200 Gb
- **Risk on standard statewide 100 m grid**
 - Many variations, for example: 40,000,000 grid points x 50 chemicals x 10 risk scenarios x 4 bytes (binary) = 80 Gb
 - Note under some risk scenarios defined by OEHHA, risk from individual chemicals is not linearly additive

Step A - Dispersion

HARP RDI/Batch Dispersion Analysis Setup

File Run Show Queue Exit

Facilities Options

Area

County/Air Basin District reporting year 201

VENTURA,SOUTH CENTRAL COAST,VENTURA COUNTY APCD,56,SCC,VEN

JTM extent (m) North 3786140 ☐ Include only facilities in this extent

West 293540 East 301250 Zone 11

South 3778850

no blanks) Ventura

Refresh list

☐ Show list by stack ☒ Show list by facility 124 items

Facilities in search area

- AERA ENERGY LLC;41;56;SCC;VEN;201
- AERA ENERGY LLC;990;56;SCC;VEN;201
- AIR COOLING TECHNOLOGY;1221;56;SCC;VEN;201
- ANACAPA BERRY FARMS;845;56;SCC;VEN;201
- ANACAPA MARINE SERVICE;433;56;SCC;VEN;201
- APPLIED SILICONE CORPORATION;264;56;SCC;VEN;201
- ARCTURUS MANUFACTURING CO;244;56;SCC;VEN;201
- ASTROFOAM MOLDING COMPANY INC.;691;56;SCC;VEN;201
- BAXTER HEALTHCARE;1078;56;SCC;VEN;201

Selected Facilities Add to list Add All Delete from list Delete All 7 items

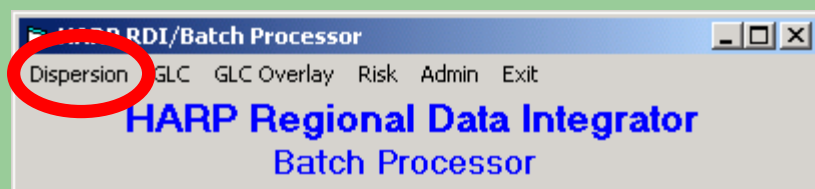
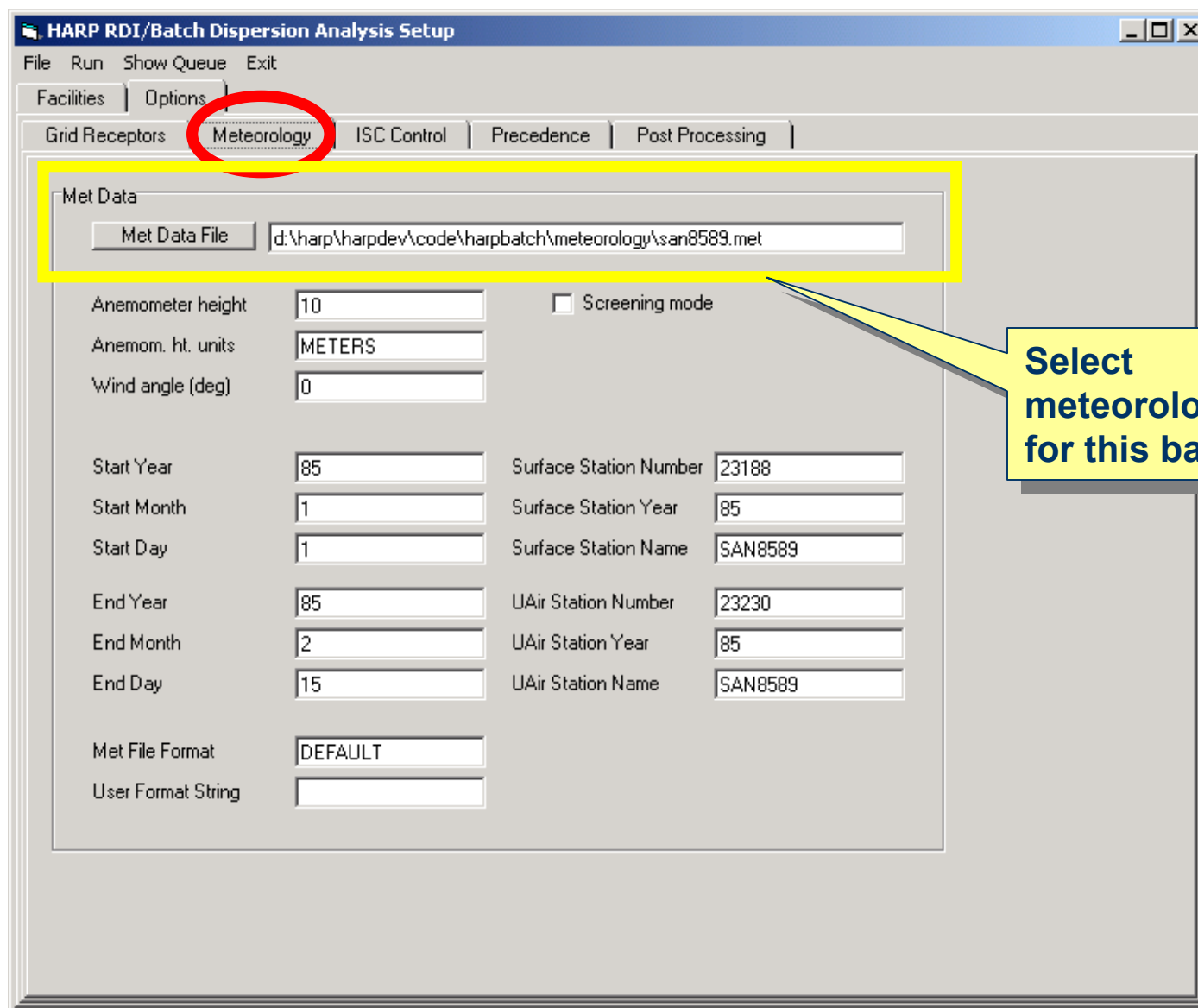
- ARCTURUS MANUFACTURING CO;244;56;SCC;VEN;201;stack 1001;298700;3779300
- ARCTURUS MANUFACTURING CO;244;56;SCC;VEN;201;stack 2101;298700;3779300
- MASON CONSTRUCT & ENGINEER CO.;1266;56;SCC;VEN;201;stack 1;295100;3782200
- MASON CONSTRUCT & ENGINEER CO.;1266;56;SCC;VEN;201;stack 3011;300200;3785200
- M-I DRILLING FLUIDS CO. OXNARD;1289;56;SCC;VEN;201;stack 1;300600;3785800
- NAVAL BASE VENTURA COUNTY;1006;56;SCC;VEN;201;stack 12;296222;3781587
- NAVAL BASE VENTURA COUNTY;1006;56;SCC;VEN;201;stack 13;296978;3781306

Select geographic area

HARP shows list of all facilities within area

Select facilities to include

Step A - Dispersion

HARP RDI/Batch Dispersion Analysis Setup

File Run Show Queue Exit

Facilities Options **Meteorology** ISC Control Precedence Post Processing

Met Data

Met Data File d:\harp\harpdev\code\harpbatch\meteorology\san8589.met

Anemometer height 10 ☐ Screening mode

Anemom. ht. units METERS

Wind angle (deg) 0

Start Year 85 Surface Station Number 23188

Start Month 1 Surface Station Year 85

Start Day 1 Surface Station Name SAN8589

End Year 85 UAir Station Number 23230

End Month 2 UAir Station Year 85

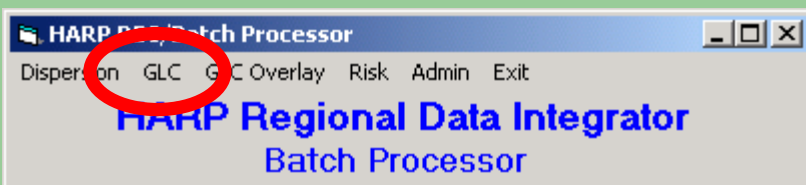
End Day 15 UAir Station Name SAN8589

Met File Format DEFAULT

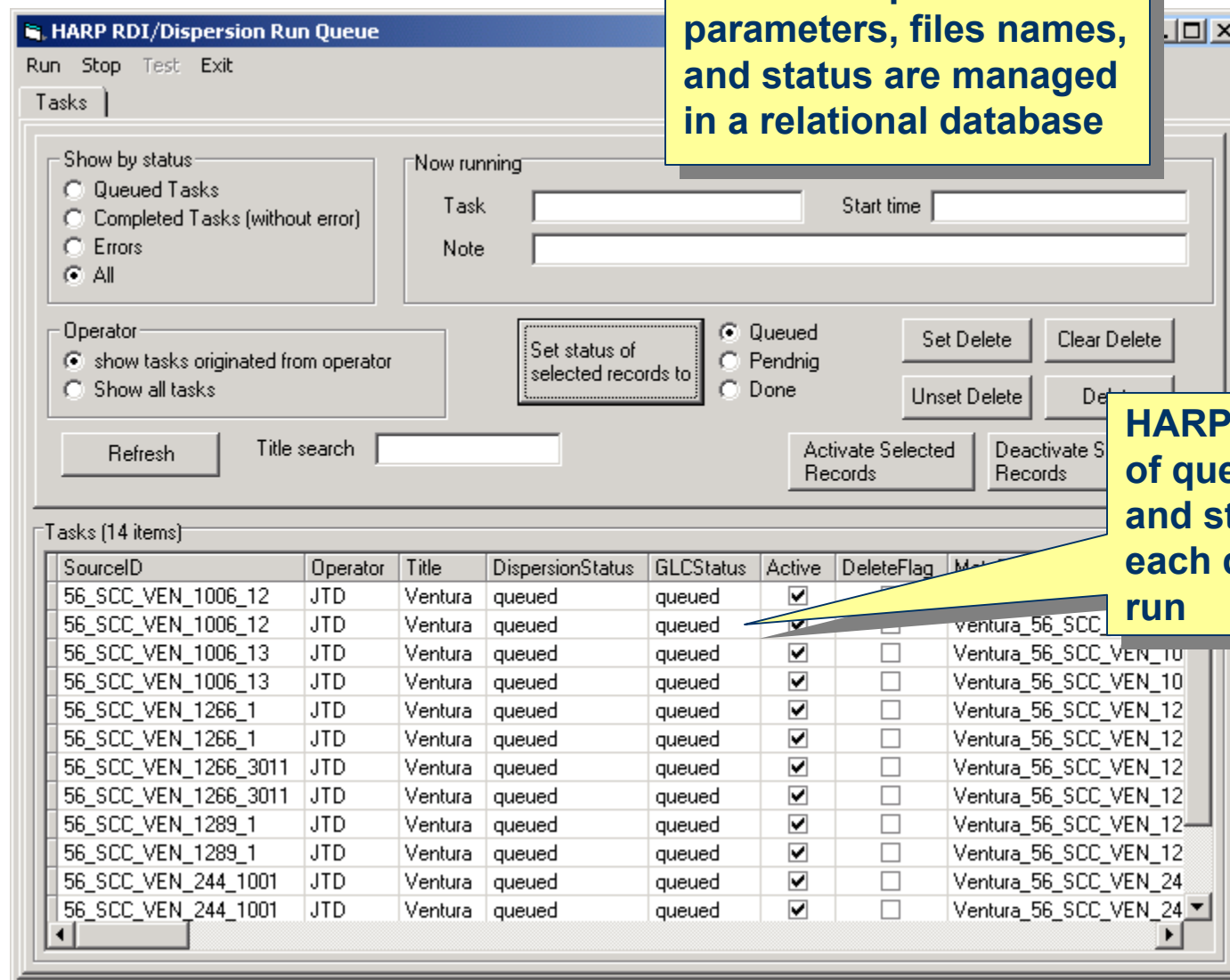
User Format String

Select meteorology data for this batch

Step B - GLC

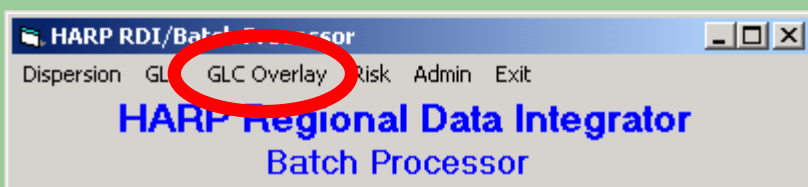


All batch input parameters, files names, and status are managed in a relational database



HARP shows list of queued tasks and status of each dispersion run

Step C - Overlay



HARP RDI/GLC Overlay
File Run Stop Exit

Analysis Extent Overlay Results GLC Data File registration

Define the tiles

Southwest corner
West (m) 70000
South (m) -432000
Grid spacing (m) 1000
Num Tiles X 1
Num Tiles Y 1
Tile size (m) 10000

Source categories to include

☒ On-road mobile
☐ Off-road mobile
☒ Industrial/Large commercial
☐ Small commercial
☐ Dispersed
☒ Total
☐ All of the above

☒ Overwrite existing files

characters, no blanks) Ventura

Activate Selected Records Deactivate Selected Records

☒ Show only active records

Sources in impact area (242 items)

GEOID_STK	Category	Batch	Task	Active	GEOID
ONROAD_CALINE_VEN_25_PARTA	ONROAD	3	1	<input checked="" type="checkbox"/>	ONROAD_CALINE_VEN_25_PARTA
ONROAD_CALINE_VEN_25_PARTB	ONROAD	3	0	<input checked="" type="checkbox"/>	ONROAD_CALINE_VEN_25_PARTB
SCOS_UAM_EXONROAD_1603	ALL	2	2	<input checked="" type="checkbox"/>	SCOS_UAM_EXONROAD_1603
SCOS_UAM_ALL_1503	ALL	2	1	<input checked="" type="checkbox"/>	SCOS_UAM_ALL_1503
0201_56_SCC_VEN_1006_26	LARGE	1	111	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_2	LARGE	1	103	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_2	LARGE	1	104	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_21	LARGE	1	105	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_21	LARGE	1	106	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_24	LARGE	1	107	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_24	LARGE	1	108	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006
0201_56_SCC_VEN_1006_196	LARGE	1	102	<input checked="" type="checkbox"/>	0201_56_SCC_VEN_1006

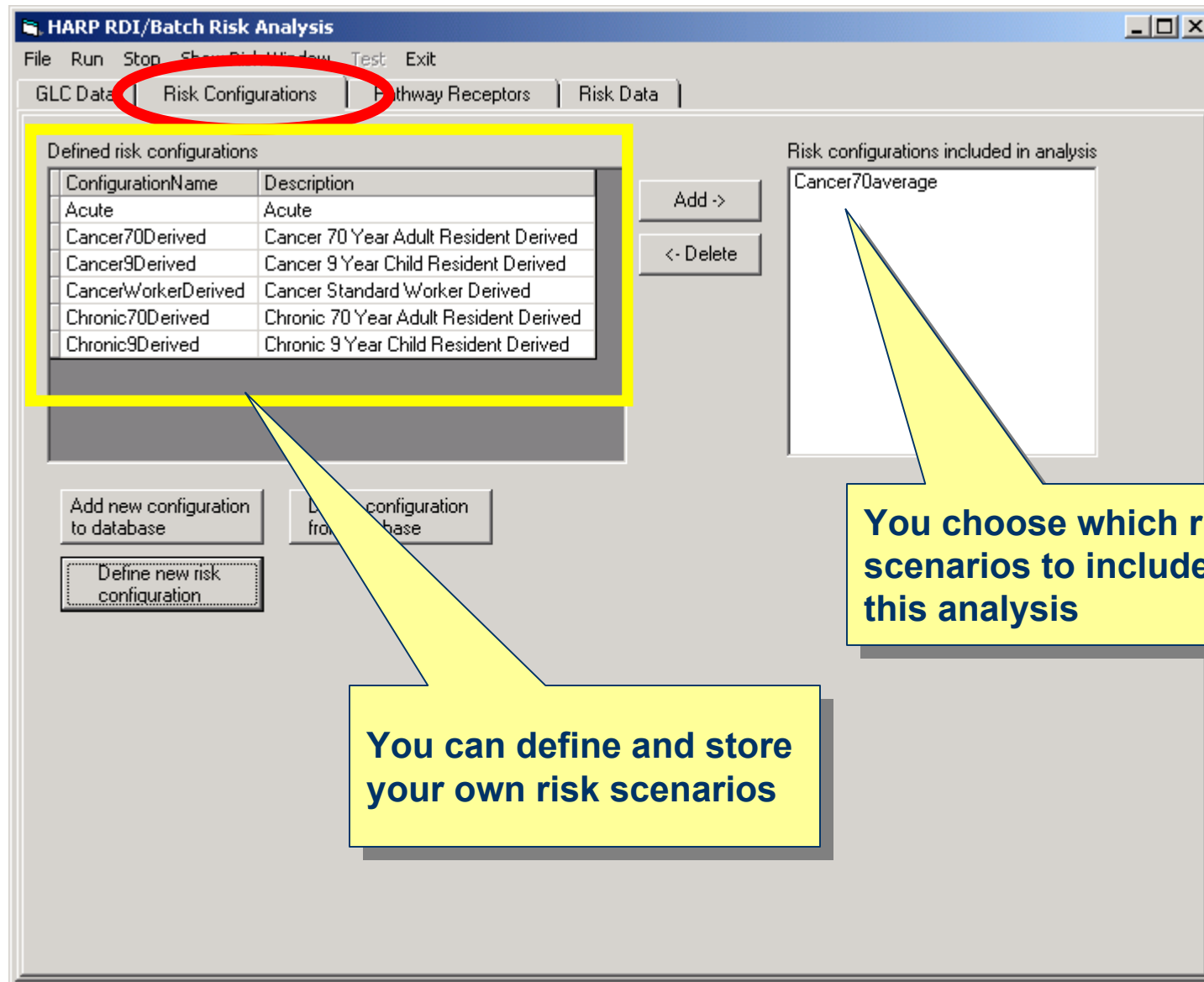
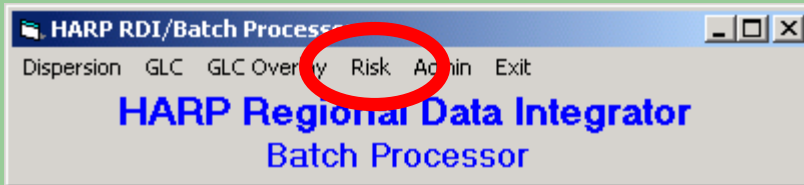
Choose which source categories to include

HARP displays a list of sources that impact this tile

GLC is computed separately for each source category

Choose one or more tiles to compute overlays

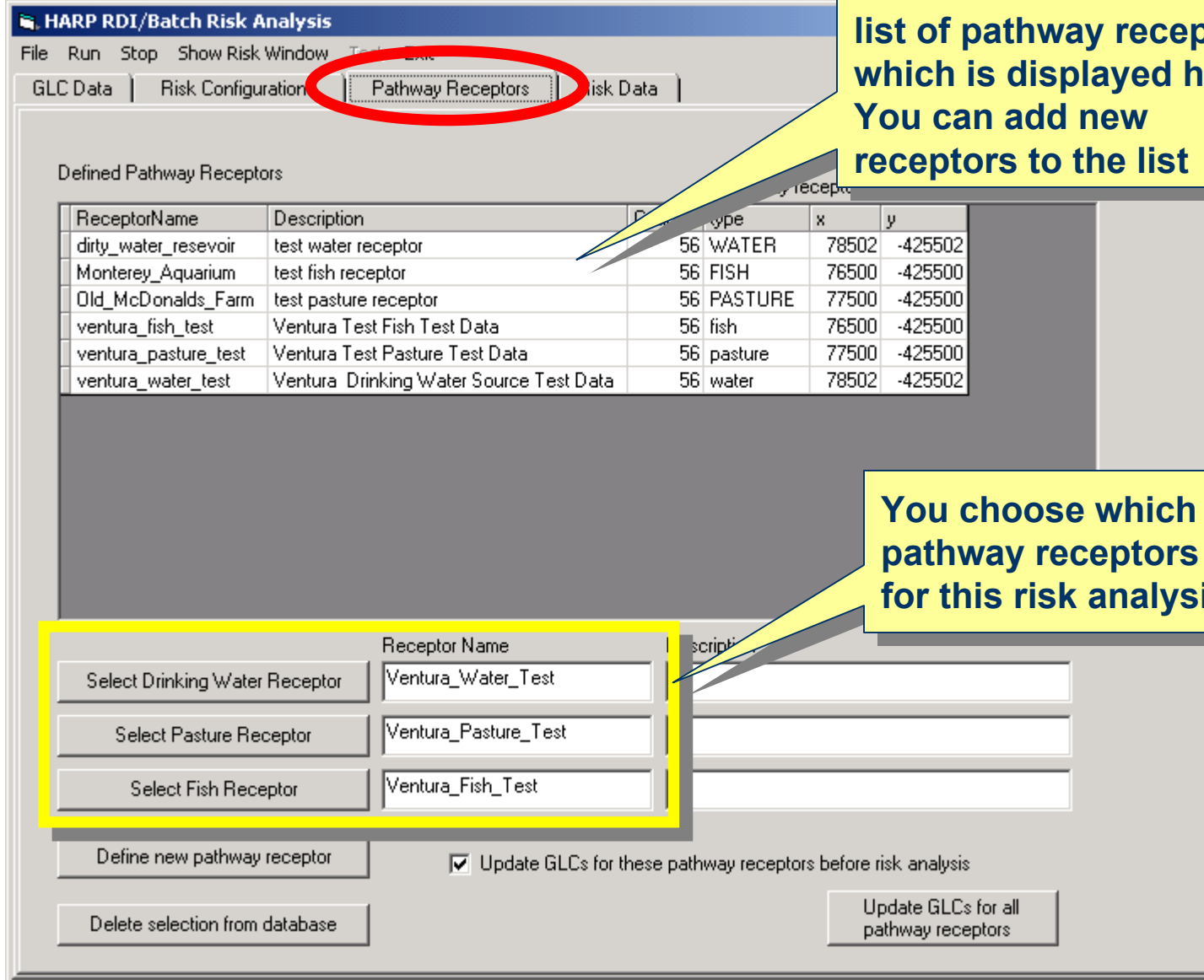
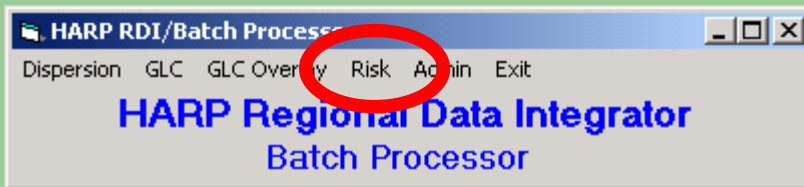
Step D – Multipathway Risk Analysis



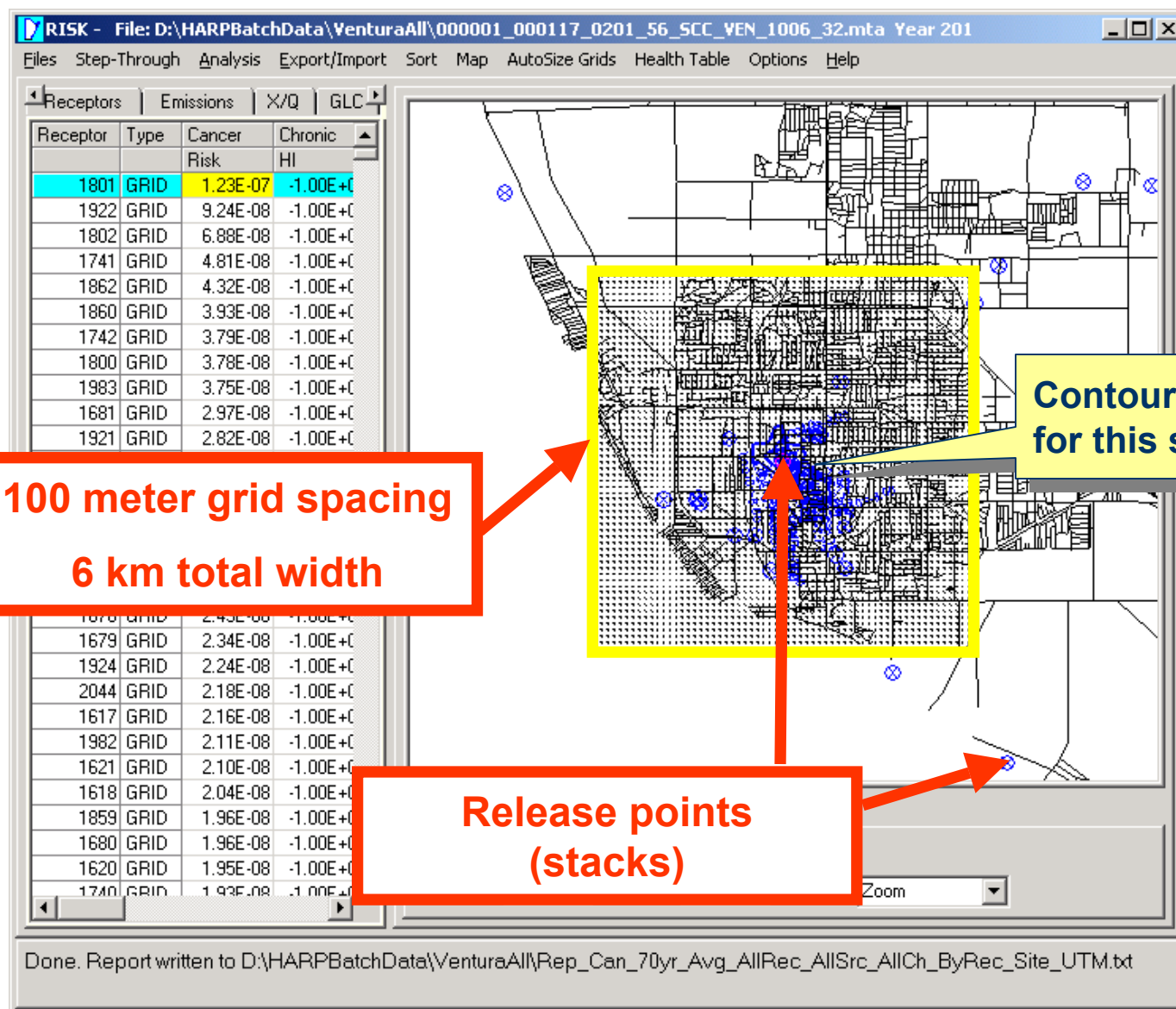
You choose which risk scenarios to include in this analysis

You can define and store your own risk scenarios

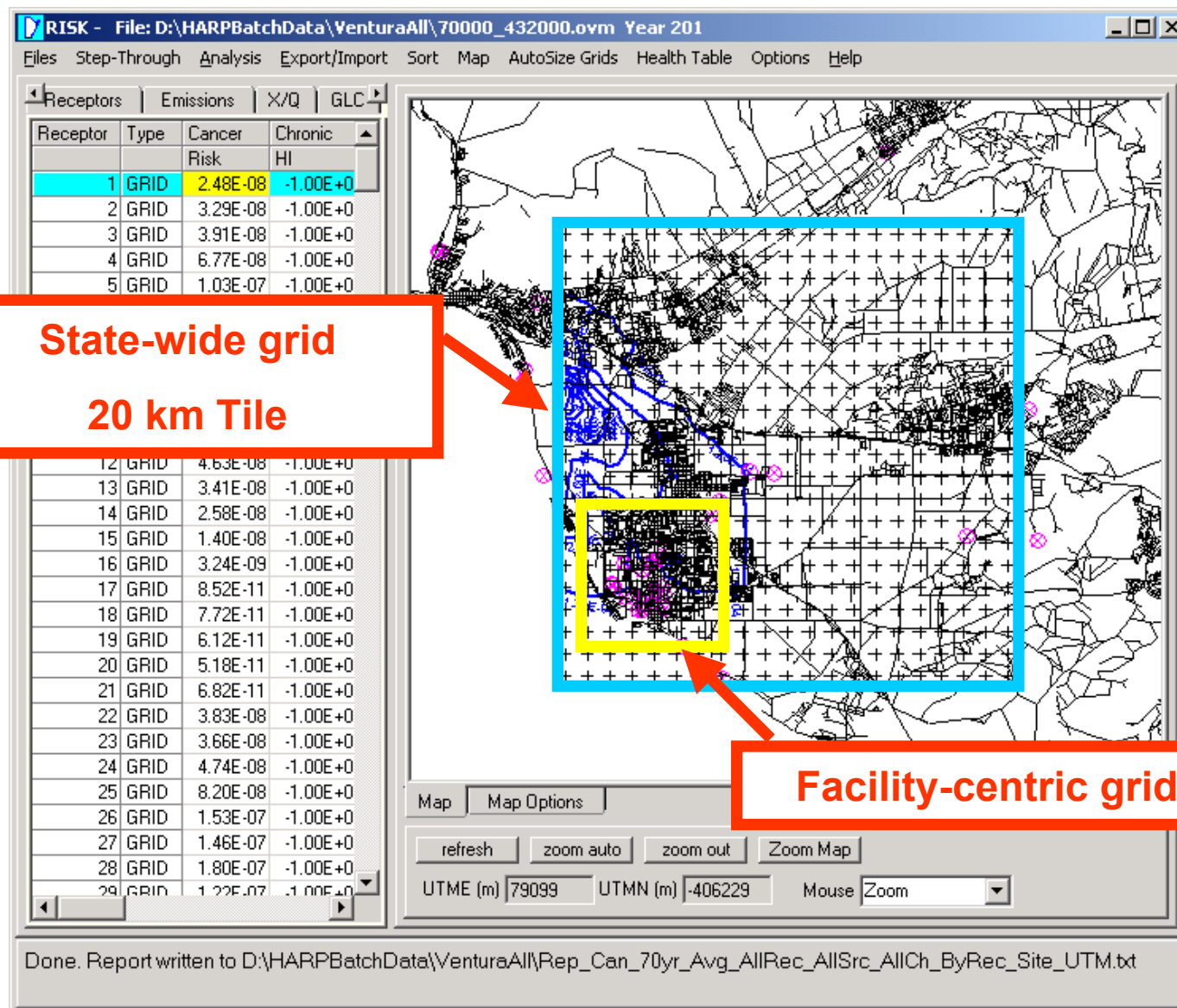
Step D – Multipathway Risk Analysis



Facility-centric grid



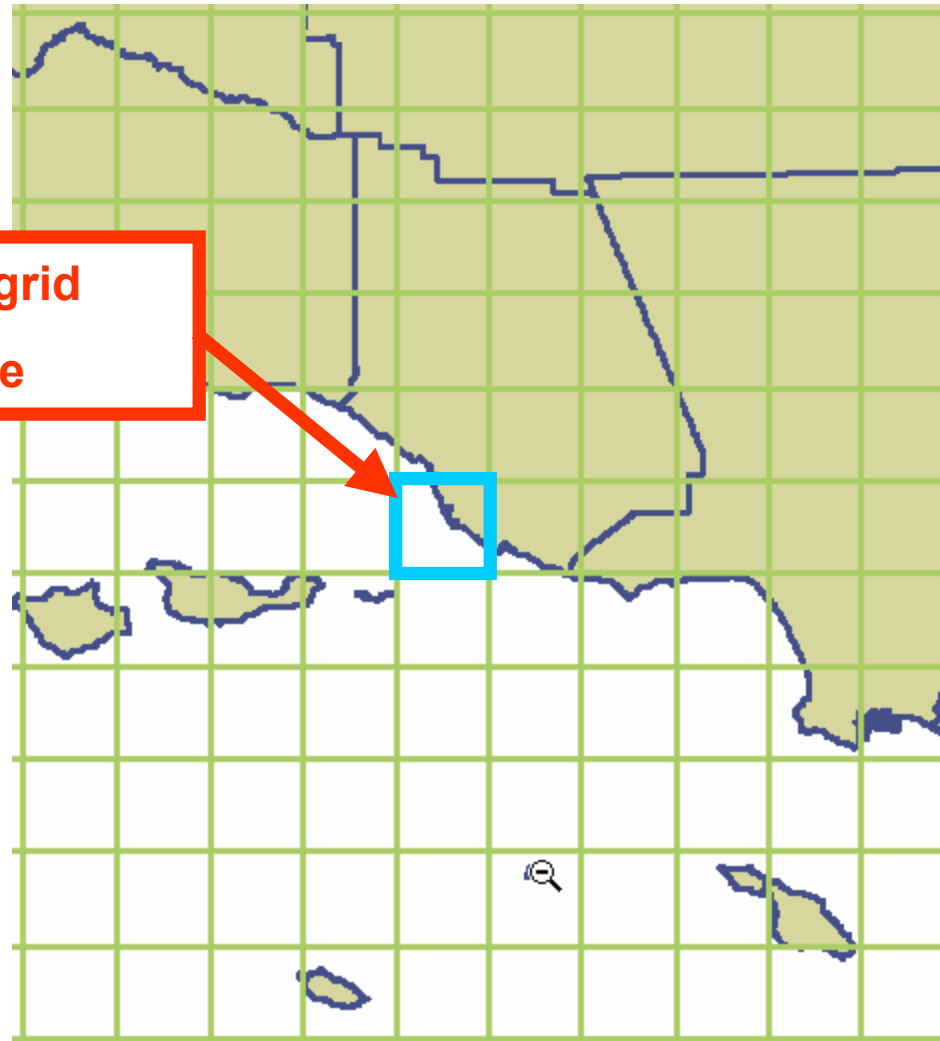
State-wide grid



Tiles on state-wide grid



State-wide grid
20 km Tile



Web-based Reporting (CHAPIS-HARP)

